
*Carex david-smithii*¹ (Cyperaceae), a New Species from High Andean Peru

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ABSTRACT. *Carex david-smithii* is described as new from Bolivia. It is most closely related to the Argentinean and Chilean *C. catamarcensis*, but differs in its dark, almost black, pistillate scales and strongly outcurved perigynia tapered to the beak. *Carex catamarcensis* has stramineous to reddish purple scales and straight perigynia abruptly contracted into the beak.

This new species was discovered in the process of preparing treatments of the monocotyledonous families included in the flora of the Huascarán National Park and International Biosphere Reserve (Smith, 1988).

The park includes the bulk of the Cordillera Blanca in the central Peruvian Andes. It extends from 8°50' to 10°00'S latitude, a distance of nearly 160 km, and has an area of 340,000 ha. Elevations range from 3,240 m to 6,770 m, at the summit of Nevado Huascarán Sur. The Cordillera Blanca is the highest tropical mountain range in the world. The geological structure of the park is complex. The northern half is a mixture of granitic and sedimentary rocks, and the southern half is sedimentary. The rocks of the sedimentary series are often metamorphosed. During several epochs of the Pleistocene, the Cordillera was extensively glaciated, and still has many glaciers and icefields. The nature of the local geology and the effects of glaciation have resulted in steep and dissected topography.

The climate of the park is a summer rainy type, dominated by air masses coming from the east. The annual precipitation is between 700 and 1,100 mm, as estimated from published data (ONERN, 1972) and unpublished weather records collected by ElectroPerú. The mean annual temperatures are 6°–

7°C at 4,000 m. At that elevation and above, freezing temperatures can occur in all months, and average minimum temperatures are below 0°C from July to December. This general picture is modified somewhat by the many microclimates created by the complex topography and geology of the Cordillera Blanca.

The vegetation of the park is a complex mosaic, including dwarf woods, shrublands, grasslands, aquatic and semi-aquatic communities, and extremely high Andean types. Of these, grasslands are the most widespread. Each vegetation type includes several different plant communities.

***Carex david-smithii* Reznicek, sp. nov.** TYPE: Peru. Ancash: Huari Prov., Huarascán National Park, upper terrace, Quebrada Pachachaca, a lateral valley of Quebrada Rurichinchay, 4,040–4,200 m, 13 June 1986, *Smith, Gonzales & Maldonado 12600* (holotype, USM; isotypes, CPUN, HUT, ISC, MO, Huascarán National Park herbarium, Ministry of Agriculture, Huaraz). Figure 1.

Plantae rhizomatibus brevirepentibus; culmi 50–130 cm alti; vaginae basales brunneae vel dilute purpurascens, glabrae. Folia ca. 15–17, plerumque basalia; laminae (28–)40–100 cm longae, 6–16 mm latae; vaginae ca. 8–35 cm longae, glabrae; ligulae ca. 4–15(–40) mm longae. Inflorescentiae 18–32 cm longae, ramuli primarii duplo (raro triplo) ramosi; spicae ultimae androgynae sessiles, 4.5–8 mm longae, 5–7.5 mm latae; bractae infimae laminis 29–60 cm longis, 5.5–10.5 mm latis, plerumque evaginatis. Perigynia 2.8–3.9 mm longa, 0.9–1.4 mm lata, patentia, valde extrorsus curvata, plano-convexa, atrata, glabra. Achenium ca. 1.5 mm longum, ca. 1 mm latum, juvenile. Styli marcescentes; stigmata 2 interdum 3. Antherae 3, 1.6–2.2 mm longae.

Plants forming extensive clones from stout, short-creeping rhizomes; roots pale brown, felted with stramineous root hairs when young; culms 50–130 cm tall, stiffly erect, trigonous, antrorsely scabrous-angled on upper portions, with glabrous, brown or faintly reddish purple tinged bladeless basal sheaths

¹David Smith, formerly Assistant Curator at the Missouri Botanical Garden, died tragically in Bolivia Feb. 7, 1991, after this manuscript was essentially complete. I have taken the liberty of changing the name of the species to commemorate him. —A. A. Reznicek.

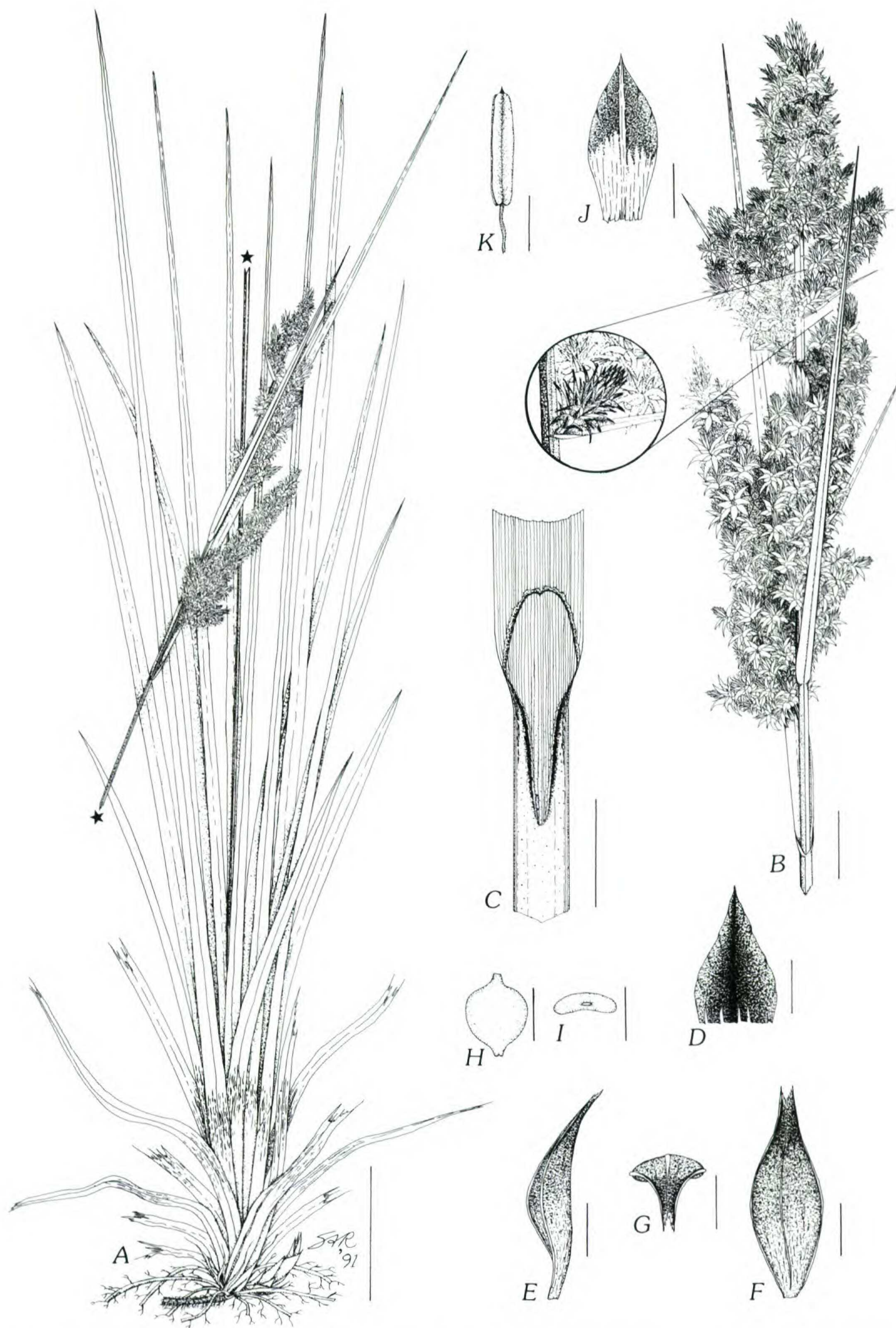


Figure 1. *Carex david-smithii*, drawn from Smith *et al.* 12600 (ISC), isotype. —A. Habit. —B. Portion of inflorescence. —C. Sheath and ligule. —D. Pistillate scale. —E. Perigynium, side view. —F. Perigynium, front view. —G. Perigynium, top view. —H. Achene, front view. —I. Achene, top view. —J. Staminate scale. —K. anther. Bar equals 2 cm in A, 1 cm in B, C, and 1 mm in D–K.

with stramineous veins. Leaves ca. 15–17, mostly basal; blades (28–)40–100 cm long, 6–16 mm wide, plicate, papillose abaxially, glabrous adaxially, the margins and keel antrorsely scabrous, widest leaves 10–16 mm wide; leaf sheaths ca. 8–35 cm long, \pm loosely enveloping culms, glabrous, the lower faintly purple tinged near base; inner band stramineous or red-streaked near margins, glabrous, faintly veined, the apex \pm deeply concave, not or very slightly thickened, purple tinged; ligules ca. 4–15 (–40) mm long, obtuse to rounded at apex, the free portion stramineous to purple tinged. Vegetative shoots unknown. Inflorescences 18–32 cm long, upper inflorescence branches strongly overlapping, lowest two inflorescence branches 5.5–15.5 cm distant; single at nodes, erect to ascending on short, stiff, trigonous, \pm scabrous-angled peduncles; the lowest inflorescence branches on peduncles 3–7.8 cm long, the upper sessile; lowermost bracts with blades 29–60 cm long and 5.5–10.5 mm wide, sheathless or rarely with a vestigial sheath up to 1.5 cm long, the uppermost bracts much reduced. Inflorescences highly compounded, with third- or rarely even fourth-order branching; primary inflorescence branches 6–8, the lowermost 9.5–21 cm long, ca. 1–2 cm wide, secondary branches ca. 18–40 per primary branch, the lowermost 0.9–2.4 cm long, ca. 0.8–1.2 cm wide, sessile or rarely with a peduncle up to 9 mm long. Ultimate branches short, androgynous, sessile spikes; spikes 4.5–8 mm long, 5–7.5 mm wide, ovate-orbicular with (1–)3–22 perigynia and ca. 4–8 staminate flowers; up to ca. 25 per secondary branch. Pistillate scales 2.1–2.8 mm long, 1.2–1.8 mm wide, ovate to broadly ovate, acute to acuminate or sometimes with a short awn up to 0.5 mm long, dark reddish purple to almost black with slightly paler margins, faintly 1–5-veined. Staminate scales 2.6–3.3 mm long, 1.2–1.6 mm wide, elliptic to narrowly obovate, acute to acuminate, dark reddish purple to almost black with paler margins, 1–3(–5)-veined. Perigynia 2.8–3.9 mm long, 0.9–1.4 mm wide, spreading and strongly outcurved, \pm planoconvex with lanceolate to narrowly elliptic faces, dark reddish purple to almost black distally, lightening to stramineous below, heavily dotted with reddish tanniferous cells, glabrous, strongly 2-veined on the margins, veinless or more faintly 1–2-veined on the faces, tapering to a bidentate apex with teeth 0.3–0.4 mm long. Achenes ca. 1.5 mm long, ca. 1 mm wide, lenticular with broadly obovate faces. Styles withering, ca. 3 mm long, stigmas 2 or sometimes 3. Anthers 3, 1.6–2.2 mm long, yellow, dotted with reddish tanniferous cells.

Paratypes. PERU. ANCASH: Huari Prov., Huascarán National Park, 2 km below Cahuish Tunnel, 4,400 m,

30 Mar. 1985, *Smith & Escalona 10118* (CPUN, HUT, ISC, MO, USM, Huascarán National Park herbarium); slopes below and valley of Laguna Ichicpotrero, 4,100 m, 8 May 1986, *Smith et al. 12419* (CPUN, HUT, ISC, MICH, MO, USM, Huascarán National Park herbarium).

Most of the cited specimens of this handsome new species are immature, and even the holotype does not have completely fully developed achenes. Thus, measurements of achenes and, to some extent, perigynia are somewhat tentative pending further collections of mature material. Another new species, similar to *Carex ancashensis* but with even longer, acute ligules, red-dotted inner bands to the sheaths, apparently more ovate perigynia with shorter beaks showing no tendency to reflex, and a broader inflorescence with distant lower branches, is represented by a specimen from Quebrada Pucaraju, a lateral valley of Quebrada Rurichinchay, *Smith et al. 12698*, 15 June 1986 (MO, USM), but the specimen is unfortunately too immature to describe.

This species grows in habitats with saturated soils or in shallow standing or slowly flowing water including boggy or marshy areas, streamsides, or lake and pond shores. Specimens have been collected from 4,040 to 4,400 m in elevation. It has been found only in Huari Province, on the eastern side of the Cordillera Blanca, where it has been collected in the Pucavado (near the Cahuish Tunnel), Carhuazcancha (in Laguna Ichicpotrero), and Rurichinchay valleys. All the localities are within the Huascarán National Park. Flowering occurs in May and June and fruiting probably from June through August.

Carex david-smithii is most closely related to *C. catamarcensis* Kük. (including *C. latebracteolata* Kük.) of Argentina and Chile. Both are large plants with highly compounded inflorescences of very similar structure composed ultimately of small, sessile, androgynous spikes. Both have stigmas regularly both two and three in the same inflorescence, and perigynia heavily dotted with reddish tanniferous cells. *Carex david-smithii* differs in having very dark, almost black pistillate scales, staminate scales, and distal portions of perigynia. *Carex catamarcensis* has stramineous to reddish purple scales and perigynia. The perigynia of *C. david-smithii* are 2.8–3.9 mm long, tapered to the apex, and strongly outcurved distally, whereas those of *C. catamarcensis* are ca. 2.2–3.5 mm long, abruptly contracted into a short beak up to 0.6 mm long, and not outcurved.

Because of its highly compounded inflorescences, Kükenthal (1909) placed *Carex catamarcensis* in section *Fecundae* Kük. (subgenus *Carex*) close to *C. fecunda* Steudel, an arrangement also followed by Barros (1935). However, the uniform, small,

sessile, androgynous spikes and lack of cladophylls show that this species and *C. david-smithii* belong in subgenus *Vignea* (P. Beauv. ex Lestib. f.) Peterm. (Reznicek, 1990). As well, in *C. fecunda* and its allies, both the first and the larger second-order branches are on long, flexuous peduncles. In *C. david-smithii* and its allies, the first-order branches of the inflorescence have short, stiff peduncles and all the other branches are sessile or essentially so. The sectional affinities of these species within subgenus *Vignea* are as yet unclear and await a sectional revision of the subgenus.

Acknowledgments. Fieldwork resulting in this paper was supported by National Geographic Society Research Grant 3069-85. We thank Susan Reznicek for the figure.

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